UDC 621.002/001.76

THE PROBLEMS OF INTELLECTUAL INNOVATION IN THE ENGINEERING INDUSTRY

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Logutova T., Dyakova M., Marchenko N. In. Problems in intellectual innovations in the engineering industry

The article discusses the need for innovative reform of the engineering industry of Ukraine, which is currently in decline. The necessity to restore the machine-building industry in any country plays a crucial role in the creation of material and technical base, but in the current situation in Ukraine without state support to revive the machine-building industry will not be possible: essential government programs and financial support, and to enter the world market of innovative new products. However, regardless of the scale of the crisis the industry is impossible without a significant investment given the significant deterioration of the equipment, without funding, without new scientific developments, without highly qualified specialists. This is due to the following factors: firstly a significant increase innovation; secondly new requirements put forward to the organization of regulation of innovative processes in industrial enterprises; thirdly insufficient scientific and methodical development of the problems of management of innovation processes of industrial enterprises. In this regard, the government of Ukraine should make every effort to maintain the innovative activity of machine-building enterprises. It is necessary to provide the industry with state orders and also for innovative products.

Логутова Т.Г., Дьякова М.С., Марченко Н.В. Проблемы интеллектуальных инноваций в машиностроительной отрасли

В статье рассматривается необходимость инновационного реформирования машиностроительной отрасли Украины, которая находится в данное время в упадке. Необходимость восстановления машиностроительной отрасли в любой стране играет решающую роль в создании материально-технической базы, но в сложившейся в Украине ситуации без поддержки государства реанимировать машиностроительную отрасли не удастся: необходимы правительственные программы и финансовая поддержка, а для выхода на мировой рынок новые инновационные продукты. Также необходимо создание современного инновационного механизма, который позволит рационально организовать инновационную деятельность на предприятии и повысить эффективность его функционирования. Это обусловлено следующими факторами: во-первых значительным ростом инноваций; во-вторых новыми требования, выдвинутыми к организации регулирования инновационных процессов на промышленных предприятиях; в-третьих недостаточной научно-методической разработкой проблем управления инновационными процессами промышленных предприятий. В связи с этим правительство Украины должно приложить максимум усилий для поддержания инновационной деятельности машиностроительных предприятий. Необходимо обеспечить отрасль государственными заказами и так же на инновационную продукцию.

Логутова Т.Г., Дьякова М.С., Марченко Н.В. Проблеми інтелектуальних інновацій у машинобудівній галузі

У статті розглядається необхідність інноваційного реформування машинобудівельної галузі України, яка знаходиться в даний час в занепаді. Необхідність відновлення машинобудівної галузі будь-якої країни відіграє вирішальну роль у створенні матеріально-технічної бази, але в Україні в данній ситуації без підтримки держави реанімувати машинобудівну галузь не вдається: необхідні державні програми і фінансова підтримка, а для виходу на світовий ринок нові інноваційні продукти. Також необхідно створення сучасного інноваційного механізму, який дозволить раціонально організувати інноваційну діяльність на підприємстві і підвищити ефективність його функціонування. Це обумовлено наступними факторами: по-перше значним зростанням інновацій; по-друге новими вимогами, висунутими до організації регулювання інноваційних процесів на промислових підприємствах; по-третє недостатньою науково-методичною розробкою проблем управління інноваційними процесами промислових підприємств. У зв'язку з цим уряд України має докласти максимум зусиль для підтримки інноваційної діяльності машинобудівних підприємств. Необхідно забезпечити галузь державними замовленнями і так само на інноваційну продукцію.

Statement of the problem. Currently, in the conditions of tough competition, engineering enterprises require innovative reform. Engineering industry, any direction, requires skilled management, implementation and use of intelligent investment. It is necessary to intensify innovation and intellectual investment. The analysis shows that the engineering industry of Ukraine is characterized by a high level of depreciation of fixed assets, low productivity and a small amount of intellectual investment.

For output the machine-building industry of Ukraine from the crisis it is necessary to introduce modern intellectual developments, which will be the basis of innovation.

Analysis of recent researches and publications. Problems of innovative development have devoted their work as foreign scientists: J. Bright, B. Twiss, Schumpeter, and domestic: O. Butnik-Siversky, A. Orlyuk, T. Logutov, P. Tsybulev, and others.

The purpose of the article: Development of the mechanism of implementation of smart investments in the machine-building industry of Ukraine.

The results of the study: Mechanical engineering is the branch of industrial production, which is the basis of the activities of all sectors of the national economy. From its operation depend on the defence industry, foreign exchange earnings, development of transport infrastructure, etc. Mechanical engineering includes a set of sub-industries: railroad, heavy machinery, agricultural and besides nearly 400 different institutions for research and development activities.To a large machine-building enterprises of Ukraine are such enterprises as JSC "Azovmash", LLC "Kharkiv carriage-building plant", PJSC "Zhytomyr butter plant", PJSC "Stakhanov wagon works", PJSC "Dneprovagonremstroy", PJSC "Novokramatorsky machine-building plant", etc.

You must stay at this enterprise, in the past, the engineering giant, as JSC "Azovmash" - one of the largest machine-building enterprises of Ukraine. Well-known in the world market as a supplier of railway wagons and platforms, bowsers, metallurgical, mining and crane equipment and defense technology (earlier "Azovmash" produces a variety of products for military industry including armored personnel carriers, tanks, towers were cast). Its origin OJSC "Azovmash" dates from 1899 when it was built metallurgical plant "Russian Providans". In 1989. "Zhdanovtyazhmash" was renamed to "Azovmash" Main activity – car building. However, due to the crisis in 2015,production ceased. Until recently, "Azovmash" was the monopoly producer of tanks in the CIS.

In 1991. in JSC "Azovmash" worked 25 thousand people. In the 90s Azovmash cooperated with foreign partners and in 1996 "Azovmash" revenue from overseas contracts amounted to 5.9 million dollars in 1997, $ 6.1 million. [1]. A new stage of development of OJSC "Azovmash" began in 2000. under the leadership of S. A. Savchuk. OJSC "Azovmash" joined JSC "mztm", "azovobschemash", "Mariupol thermal plant", "GSKTI" and LLC "WAS to them.

V. M. Bubnov". Products of OJSC "Azovmash" in the late ' 30s were as follows: rail cars and tank cars, car casting, metallurgy, lifting and transport equipment, mining equipment, equipment for the production of pig iron, equipment for steel production, fuelling machinery and special equipment.

Also I would like to dwell on such a large enterprise as PJSC "Kryukovsky railway car building works" is a unique enterprise of the mixed type, where a single production site are created and manufactured as freight and locomotive-hauled passenger coaches, inter-regional and suburban trains, diesel trains, subway cars, escalators, running gear for freight and passenger cars. The company originates from 1869 with a small car-repair shops. In 1924, with the development of industrial production, "Kryukovsky car-repair workshops" were converted to production of railway equipment and began producing the 16-ton boxcars with metal frame. In 2013 the company employed more than 6.5 thousand people. This company was established more than 48 models of passenger cars of various types and classes. In 2002, assembled the first domestic floor escalator, in 2004 four first tunnel escalators for the Kiev metro. Today the escalators, made by "krcbw", working not only in Ukraine and in St. Petersburg and in the Moscow metro.

When the Soviet Union was left of the enterprise producing individual components, which have been exported to Russia for further resupply and complete Assembly of finished products.

To date the main market for Ukrainian products of the engineering industry was Russia. Recently part of engineering products of Ukraine's exports to Russia is from 11 to 21%.

In 2015. OJSC "Azovmash" has only 10 thousand people, of them work only 10%. In 2013. the revenue of JSC "Azovmash" was reduced by 37% compared to 2012. and amounted to 6 billion 463,1 mln. but this time increased the production of heavy engineering products 28.7% to 418,33 mln. In 2014 OJSC "Azovmash" released only 623 of wagon against 10,471 thousand units in 2013, the volume of production in the plant amounted to $ 350,2 million (in 2012. — 5,536 bn) [2]. In PJSC "KVSZ" the situation is not better. 2014. the company ended with a loss in the amount of 357,57 million USD. whereas, in 2013. its net profit stood 339,38 mn.In 2013. the plant produced 5316 freight cars and 74 passenger. In 2014, PJSC "KVSZ" produced 2407 cars, which is 55.34% or 2983 of the car less than 2013., Of which 1 passenger 74 against the passenger for 2013 [3]. This is due to the loss of the Russian market. PJSC "KVSZ" considering the possibility of delivery of freight locomotives for "Ukrzaliznytsya" in 2017

The situation in the engineering industry, possibly only change by way of innovation, based on the introduction of intellectual property. Unfortunately 4/5 researchers (doctors and candidates of Sciences) are currently engaged in research at Universities, not at the industrial enterprises, the relationship of UNIVERSITY - enterprise lost. And while scientists of Universities created a lot of new developments, patents, during the introduction at the enterprises could bring these businesses to be a success, manufacturers are not interested in these developments.

That is the main problem of the deployment of intelligent investments in machine-building industry is the lack of the mechanism of state support for the development and implementation of innovations. The experience of advanced countries: USA, Israel, Japan, Germany showed that in these countries there is a system of support and development personnel research and innovation sector, developed a really effective national innovation policy. In the percentage of Ukrainian innovative products on the world market is less than 0.1%, while in Russia to 0.5%, Germany 17%, Japan – 30%, USA 36% of total world production.

Practice has shown that the development, introduction and manufacture of innovative products goes from 3 or more years. But we must also consider the fact that if the employees are employed on less than 50% of the time, respectively, and taxation unified budget reduced. If enterprises are occupied only 10% of the working days, then in this case the entity will not be considered innovative in structure, and can only rely on soft loans. In many countries of the

world engineering innovation active enterprises that promote innovation, receive additional benefits, which are used for innovative transformations.

Besides the above listed conditions for implementation of innovative transformations, skilled professionals and experienced managers.

Innovation will not yield positive result if it does not coincide with the main directions of activity of machine-building enterprises. Thus, the steering apparatus of the enterprise should combine skilled professionals and excellent managers.

So in 2013 scientific activity in Ukraine was conducted by the staff 1143 enterprises, 123.2 thousand employees were engaged in research and technical work, including 4532 Dr. 15893 Sciences and candidate of Sciences. To perform scientific and scientific-technical works has been used 1116,1 mn. In Donetsk region the research was: 63 enterprises, 7.2 thousand employees, 171 PhD and 633 PhD. To perform scientific and scientific-technical works used 509,8 million UAH.[5].

Table 1 - Analysis of innovation of industrial enterprises in Ukraine for 2009-2013. [compiled from State Statistics Committee of Ukraine]

Name	2009 year	2010year	2011year	2012year	2013year
Introduced innovative products, names, units.	2685	2408	3238	3403	3138
Including: Machines, equipment, devices etc, units.	641	663	897	942	809
New technological processes, units.	1893	2043	2510	2188	1576
Low-waste and energy-saving, units	753	479	517	554	502
The number of innovation active product units.	1180	1217	1327	1758	1715
The share of innovation active product, %	12,8	13,8	16,2	17,4	16,8
The volume of sales, UAH million.	31,4	33,7	42,7	36,2	35,9

The analysis shows that in Ukraine in 2013. in comparison with 2012. the number of enterprises that were engaged in the development and implementation of intellectual property, decreased by 2.6% and amounted to 2224 out of which 2/3 of the industrial enterprise. In 2013, innovative developments created 176 enterprises in Donetsk region (6.3 per cent).These enterprises were created 486 kinds of innovative product from 13.6% new, 16% - created by the state order. At processing enterprises have implemented half of rationalization proposals, and 43.6 percent in transport companies. In 2013 in Donetsk region it is 31.7%. So workers in the engineering industry inventions were filed in 2005. – 402, 2010. – 319, 2011. -258, 2012. – 248, and in 2013 – 331. Utility models in 2005. – 1285, 201, 1743, in 2011. – 1756, in 2012. – 1593, and in 2013 1410. This implies that inventions for the period since 2005. in 2013, 71 filed fewer units and utility models for the period since 2005. to 2013. 125 more units [4]. The company currently serves more utility models than invention because the maintenance of the utility model is cheaper than the invention, and the level of intellectual and legal protection they require the same costs.

Currently industrial enterprises face the problem of lack of natural resources, which are increasingly expensive and therefore, effective implementation of intellectual investment helped would be wise to implement energy-saving and resource-saving technologies in machine-

building enterprises. Development of resource-saving technologies by scientists of many countries of Europe, USA and Ukraine.

The unstable condition of the Ukrainian machine-building enterprises makes the task of finding the ways out of the situation by mobilizing their internal resources and the need to introduce innovative products. But the first factor inhibit the introduction of innovative products is insufficient attention to the organization of the system of managerial potential. Constant competition among industrial enterprises promotes the use of its own capacity of individual enterprises to develop an effective development strategy. But the modernization of production and the generation of innovations have not yet become conscious of the need for certain executives of the companies.

Subject to the foregoing, the authors proposed a mechanism for the introduction and use of intellectual investment in machine-building enterprises.

The mechanism allows to consider all possible elements, but allows for the possibility of new within the listed ingredients. These components are activated when it is necessary to carry out the development and implementation of intelligent innovation, or to promote intellectual innovation of innovations in the product (Fig. 1.).

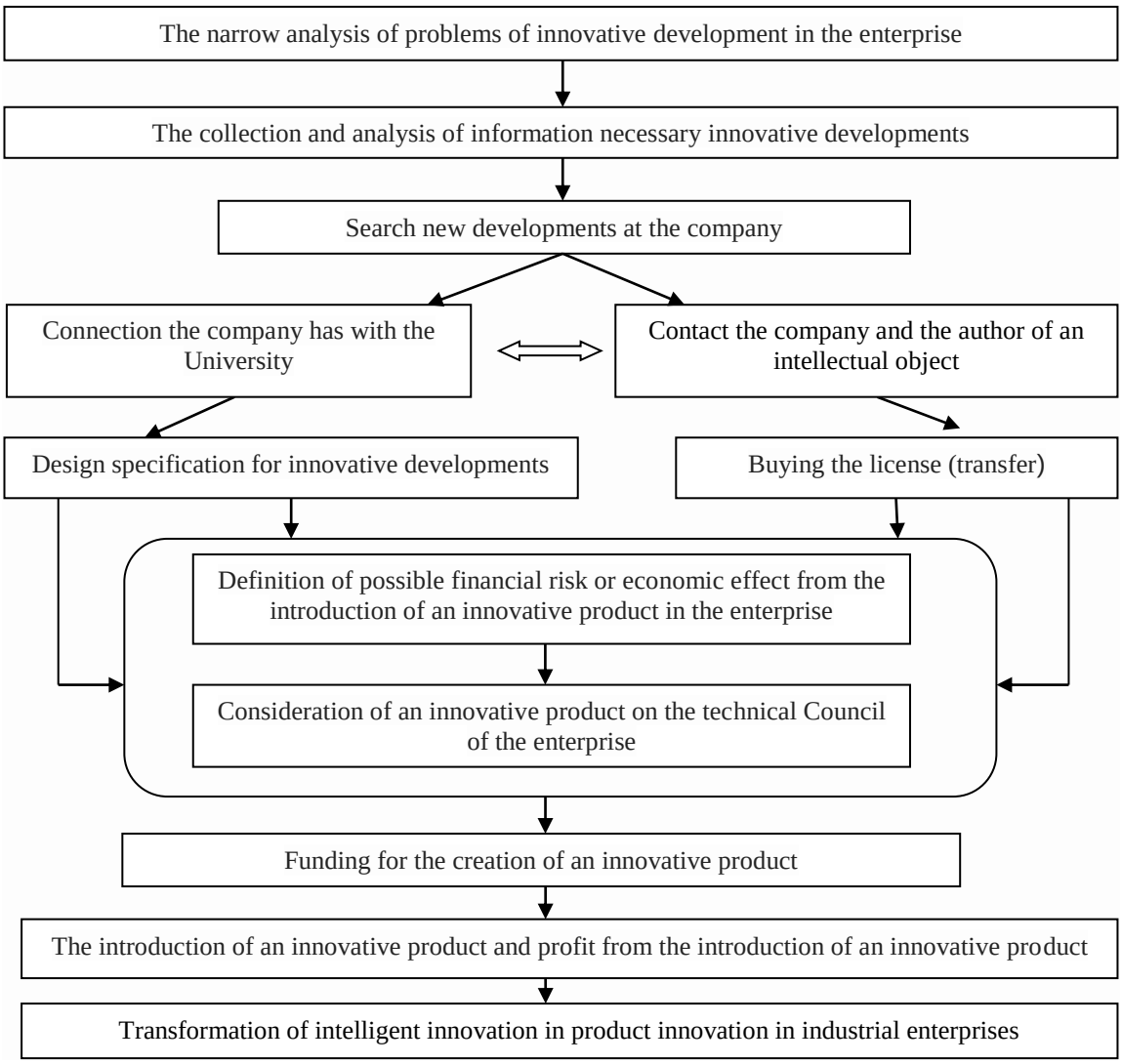

Figure 1 - Mechanism for the deployment of intelligent innovation in product innovation in engineering enterprises (developed by authors).

For the introduction of intellectual investment necessary phased implementation of actions in the following sequence:

1. Inventory of intellectual property that will allow objectively to charge depreciation of equipment and to determine the costs for the creation and implementation of new and innovative features.

2. Performing predictive analysis of the implementation, use and effectiveness of innovative objects, as well as the analysis of labor and human resources, analysis, financing and profit.

3. To make rational decisions on the implementation and use of intelligent innovation.

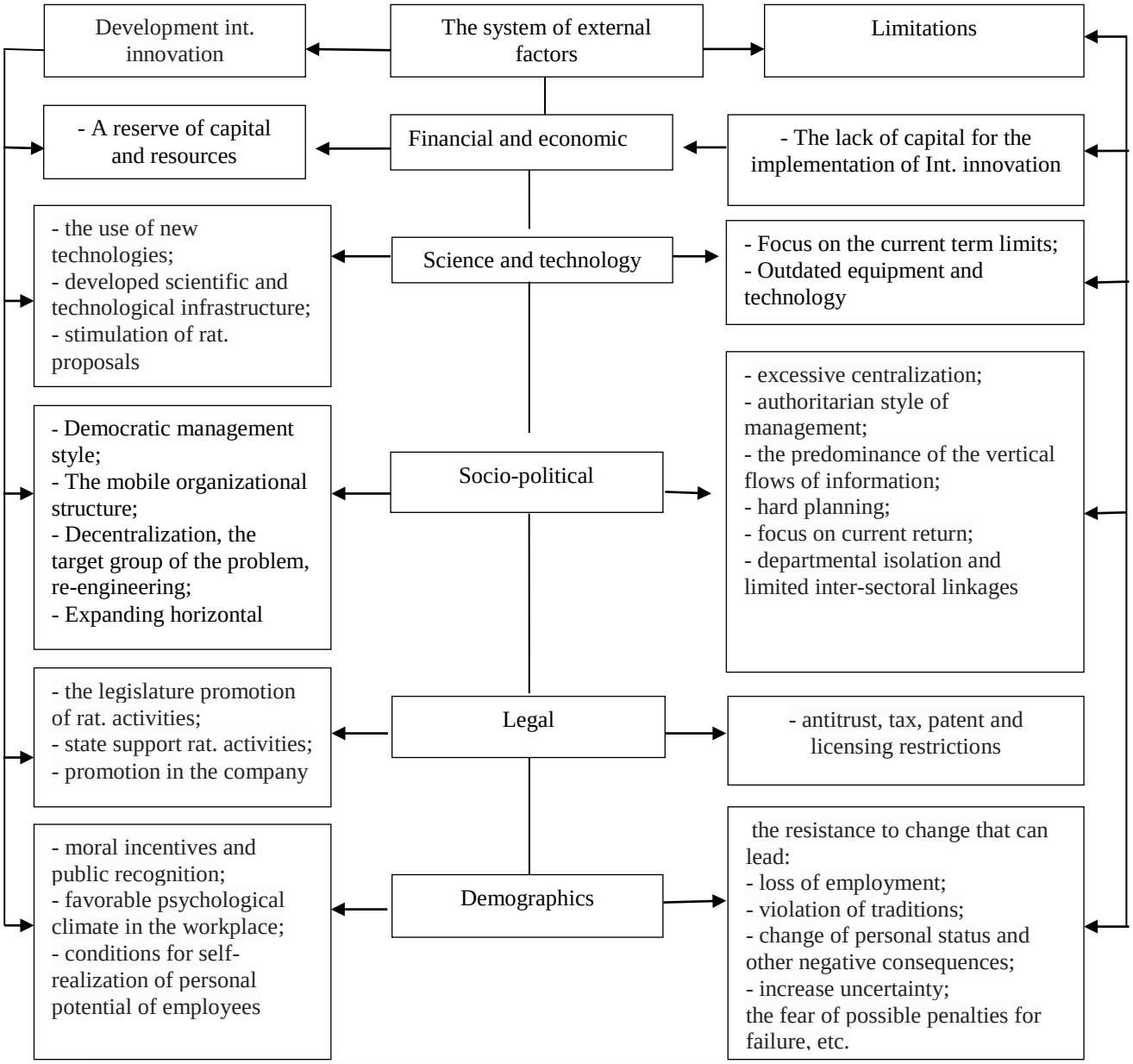

Figure 2. – Factors influencing the adoption of smart innovation in engineering enterprises.

Exploring the conditions of formation of innovative mechanism of the enterprise, it should be considered that in each group of factors are the same options depending on their values can be both positive and negative impact. Therefore there is a need to systematize the factors and determine their significance.

But without state support and developed programs development, implementation, use and commercialization of innovative intellectual products impossible. Therefore, the directions of

development of system of state regulation of innovation development of industrial enterprises, which will stimulate the process of promotion of innovation products of industrial enterprises that will contribute to their effective innovative development taking into account the current socio-economic requirements.

It showed that the state innovation policy should be based is ambiguous in various branches of the real sector of the economy relative to industrial production. We identified the following possible forms of state support of innovative development of industrial enterprises (Fig.3.).

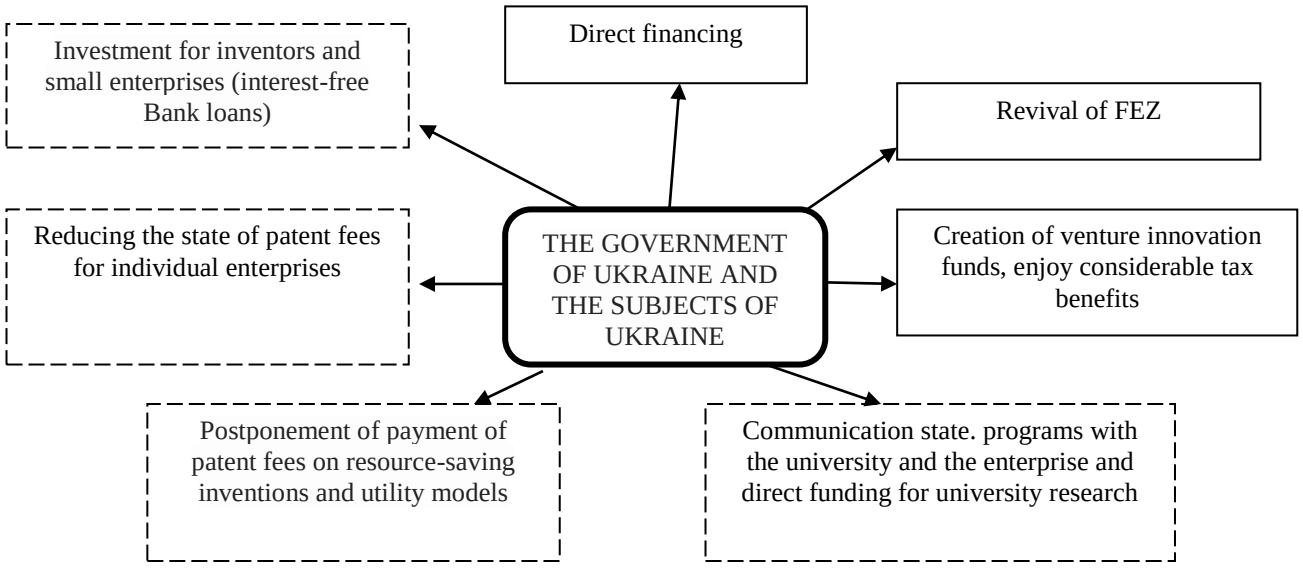

Figure 3. – Systematization of the forms of state support of innovative activities (proposed by authors).

Analyzing the form of state support and the current situation in engineering enterprises consider to be the most preferred form of support in the promotion of intelligent product innovation, which is presented in Fig. 3.

Conclusions. Rational management of intellectual innovation will help engineering enterprises to make the right decisions regarding the development, creation, implementation and commercialization of intellectual products. Improving intellectual development of innovations is possible only with government support, promotion and financing of intellectual activity of machine-building enterprises, the tax reduction VAT exemption, soft loans, support of research institutions and the support of highly skilled human resources.

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Ключові слова: машинобудівна галузь, інновації, інноваційний продукт, підтримка інновацій, винахід.

Ключевые слова: машиностроительная отрасль, инровации, инновационный продукт, поддержка инноваций, изобретение.

Keywords: engineering industry, innovation, product innovation, support for innovation, invention.

УДК 332.122:338.47

ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНЕ СЕРЕДОВИЩЕ МІЖНАРОДНОЇ ЛОГІСТИКИ

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Тронько В.В., Дугінець Г.В. Інформаційно-комунікаційне середовище міжнародної логістики.

В дослідженні визначено, що міжнародна логістика є однією зі складових економічної системи, тому її розвиток безпосередньо пов'язаний із загальними еволюційними тенденціями: зростаючої ролі інформації та засобів комунікації; виникнення і швидке поширення мережевих структур, розмивання меж національних ринків як наслідок глобалізації. За результатами аналізу визначено, що новації змінюють сучасні методи ведення бізнесу, переформатовують концепцію міжнародної логістики, надаючи перевагу у економічній та політичній могутності країнам – технологічним та інформаційним лідерам. Зазначено, що Internet створив нові ринки, нові канали збуту, пришвидшив обмін товарами, зумовив нові відносини між покупцем та продавцем, нові товари – віртуальні товари, які можна реалізовувати через комп'ютерну мережу без додаткового пересилання інформації через фізичні канали зв'язку. Доведено, що застосування саме Інтернету в міжнародній логістиці доцільно тим, що дозволяє вдатися до процедури електронної комерції, а отже, абстрагуватися від просторового параметру угоди, фіксуючого місцезнаходження замовника і постачальника в момент її укладання, і сконцентруватися на тимчасовому параметрі її виконання. Отримано висновок, що сучасне інформаційно-коммунікаційне середовище створює кращі умови для взаємного співробітництва, здійснення ефективних бізнес-процесів за рахунок високого ступеня спільного використання інформаційно-комунікаційних технологій з метою забезпечення істотної конкурентної переваги на світовому ринку.

Tronko V., Duginets A. Information and communication environment of international logistics.

The study has determined that International Logistics are part of the economic system, so its development is directly linked with the general evolutionary trends: the growing role of information and communication, the emergence and rapid spread of network structures, the "blurring" of national markets' boundaries due to the influence of globalization. The analysis has determined that innovations are changing modern business methods and the format of international logistics, providing an advantage in economic and political power to the leading countries in technology and information. The Internet has allowed for new markets and new channels, speeding up the exchange of goods, creating new forms of relationships between buyer and seller, and providing conditions necessary for a new form of goods – virtual goods - which can be transferred through a computer network without additional use of physical channels. The